

AIR QUALITY REPORT

San Diego Freeway (I-405) Improvement Project
SR-73 to I-605

Orange and Los Angeles Counties

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EXECUTIVE SUMMARY

The Orange County Transportation Authority (OCTA) and California Department of Transportation (Caltrans) propose improvements on Interstate 405 (I-405) between SR-73 (PM 9.3) and Interstate 605 (I-605) (PM 24.G) (Regional Transportation Plan and Regional Transportation Improvement Plan ID ORA030605). The project covers a distance of approximately 1½ miles. Within the limits of the proposed project, I-405 is a controlled-access highway facility with a fenced right-of-way (ROW), separated by grade from crossing traffic, with vehicular access limited to interchanges. Within the project area, I-405 consists of 8 to 12 mixed-flow general purpose (GP) lanes and two high-occupancy vehicle (HOV) lanes. There are three proposed Build Alternatives. Alternative 1 includes one additional general purpose lane in each direction and interchange reconfigurations at Euclid Street, Ellis Avenue, Brookhurst Street, Magnolia Street, Warner Avenue, Beach Boulevard, and Westminster Boulevard. Alternative 2 would add one general purpose lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternative 1), plus add a second general purpose lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second general purpose lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street. Alternative 3 would add one GP lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternatives 1 and 2), plus add a tolled express lane in each direction of I-405 from SR-73 to I-605. The tolled express lane would be placed beside the existing HOV lane in each direction. The existing HOV lanes and new toll lanes would be managed jointly as an Express Lane Facility with two lanes in each direction.

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) and other pollutants generated by excavation, grading, hauling, and various other activities related to construction. Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. The five-year construction period would begin in 2015. All construction vehicles and equipment would be required to be equipped with the State-mandated emission control devices pursuant to State emission regulations and standard construction practices. After construction of the proposed project is complete, all construction-related impacts would cease, thus resulting in a less than significant impact. Short-term construction particulate matter emissions would be further reduced with the implementation of required dust suppression measures outlined within the South Coast Air Quality Management District rules and regulations. Caltrans Standard Specifications for Construction (Section 10 and 18 [Dust Control] and Section 39-3.06 [Asphalt Concrete Plants]) would also be adhered to. Therefore, project construction would not violate State or federal air quality standards or contribute to the existing air quality violations in the South Coast Air Basin.

A regional operational emissions analysis was completed based on vehicle miles traveled and vehicle speeds. Regional emissions would be less than baseline conditions in years 2020 and 2040. This decrease is due to higher vehicle speeds under the build alternatives, which generally result in lower emission rates. Regional operational emissions would result in a beneficial impact under the build alternatives.

Particulate matter and carbon monoxide hotspot analyses were completed based on the Transportation Conformity Rule. The proposed project underwent interagency consultation which determined the proposed project to be a Project of Air Quality Concern. A qualitative particulate matter hotspot analysis was completed that concluded that the proposed project would not cause new or delay timely attainment of the National Ambient Air Quality Standards.

EXECUTIVE SUMMARY

The Orange County Transportation Authority (OCTA) and California Department of Transportation (Caltrans) propose improvements on Interstate 405 (I-405) between SR-73 (PM 9.3) and Interstate 605 (I-605) (PM 24.1) (Regional Transportation Improvement Plan ID ORA030605). The project covers a distance of approximately 14 miles. Within the limits of the proposed project, I-405 is a controlled-access highway facility with a fenced right-of-way (ROW), separated by grade from crossing traffic, with vehicular access limited to interchanges. Within the project area, I-405 consists of 8 to 12 mixed-flow general purpose (GP) lanes and two high-occupancy vehicle (HOV) lanes. There are three proposed Build Alternatives. Alternative 1 includes one additional general purpose lane in each direction and interchange reconfigurations at Euclid Street, Ellis Avenue, Brookhurst Street, Magnolia Street, Warner Avenue, Beach Boulevard, and Westminster Boulevard. Alternative 2 would add one general purpose lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternative 1), plus add a second general purpose lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second general purpose lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street. Alternative 3 would add one GP lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternatives 1 and 2), plus add a tolled express lane in each direction of I-405 from SR-73 to I-605. The tolled express lane would be placed beside the existing HOV lane in each direction. The existing HOV lanes and new toll lanes would be managed jointly as an Express Lane Facility with two lanes in each direction.

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A regional operational emissions analysis was completed based on vehicle miles traveled and vehicle speeds. Regional emissions would be less than baseline conditions in years 2020 and 2040. This decrease is due to higher vehicle speeds under the build alternatives, which generally result in lower emission rates. Regional operational emissions would result in a beneficial impact under the build alternatives.

Particulate matter and carbon monoxide hotspot analyses were completed based on the Transportation Conformity Rule. The proposed project underwent interagency consultation which determined the proposed project to be a Project of Air Quality Concern. A qualitative particulate matter hotspot analysis was completed that concluded that the proposed project would not cause new or delay timely attainment of the National Ambient Air Quality Standards.

In addition, the carbon monoxide analysis was completed in accordance with Caltrans guidance and indicated that the proposed project would not generate a carbon monoxide hotspot.

A qualitative diesel particulate matter was completed for the proposed project. It was determined that while diesel exhaust may pose potential cancer risks to receptors spending time on or near high risk diesel particulate matter facilities, most receptors' short term exposure would only cause minimal harm, and these risks would also greatly diminish in the future operating years of the proposed project due to planned emission control regulations. Diesel particulate matter emissions would not result in an adverse impact under the build alternatives.

A Mobile Source Air Toxic analysis was completed for the proposed project. The analysis determined that the build alternatives would have lower emissions compared to the No Build Alternative for the years 2020 and 2040. Mobile Source Air Toxic emissions would not result in an adverse impact under the build alternatives.

An asbestos analysis was completed for the proposed project. The project corridor is not located in a known or suspected asbestos area and the likelihood of encountering structural asbestos is low due to the nature of the demolished materials. Asbestos exposure would not result in an adverse impact under the build alternatives.

A greenhouse gas analysis was completed pursuant to Caltrans guidelines. Future greenhouse gas emissions (2020 and 2040) would be greater than existing emissions. Air quality modeling indicates that technological changes in automobile engines will not result in less greenhouse gas emissions in the future. However, automobiles will generate fewer greenhouse gas emissions under higher speeds. The proposed project would decrease congestion and increase speeds. Therefore, the proposed project would result in fewer greenhouse gas emissions than the No Build Alternative in 2020 and 2040.

Regional and project-level transportation conformity analyses were completed for the proposed project. On a regional level, the proposed project is consistent with the 2008 Regional Transportation Plan. On a local level, the proposed project would not cause new violations or increase the frequency or severity of any existing violations, or delay timely attainment of the National Ambient Air Quality Standards. The proposed project would be consistent with transportation conformity requirements.

1.0 INTRODUCTION

The purpose of this report is to evaluate the potential for air quality impacts of the I-405 Improvement Project. Potential air quality emissions are analyzed for construction and operational activities. Mitigation measures for potentially significant impacts are recommended when appropriate to reduce air quality emissions.

1.1 PROJECT LOCATION AND SETTING

The proposed project is located in Orange County on I-405 between SR-73 (PM 9.3) and Interstate 605 (I-605) (PM 24.1) (**Figure 1-1**). The project covers a distance of approximately 14 miles. Within the limits of the proposed project, I-405 is a controlled-access highway facility with a fenced right-of-way (ROW), separated by grade from crossing traffic, with vehicular access limited to interchanges. Within the project area, I-405 consists of 8 to 12 mixed-flow general purpose (GP) lanes and two high-occupancy vehicle (HOV) lanes.

1.2 PROJECT DESCRIPTION

This environmental analysis evaluates the consequences of three build options (Alternatives 1, 2, and 3), as well as a No Build Alternative. Descriptions of Alternatives 1, 2, 3, and the No Build Alternative are provided below. **Figure 1-2** shows map of the roadway configuration associated with each alternative. Please refer to Air Quality Appendix I for detailed drawings of each project alternative.

Common Design Features of the Build Alternatives

Build Alternatives 1, 2, and 3 would include the following features:

- One GP lane would be added in each direction of I-405 from Euclid Street to the I-605 interchange.
- Travel lanes on the I-405 mainline would be 12-feet-wide, and right side shoulders would be 10-feet-wide.
- The pedestrian bridge and local street overcrossings proposed for complete replacement under Alternatives 1, 2, and 3 are the following:
 - Ward Street
 - Talbert Avenue
 - Brookhurst Street
 - Slater Avenue
 - Bushard Street
 - Warner Avenue
 - Magnolia Street
 - Pedestrian overcrossing near Heil Avenue
 - Newland Street
 - Edinger Avenue
 - McFadden Avenue
 - Bolsa Avenue

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SOURCE: PARSONS

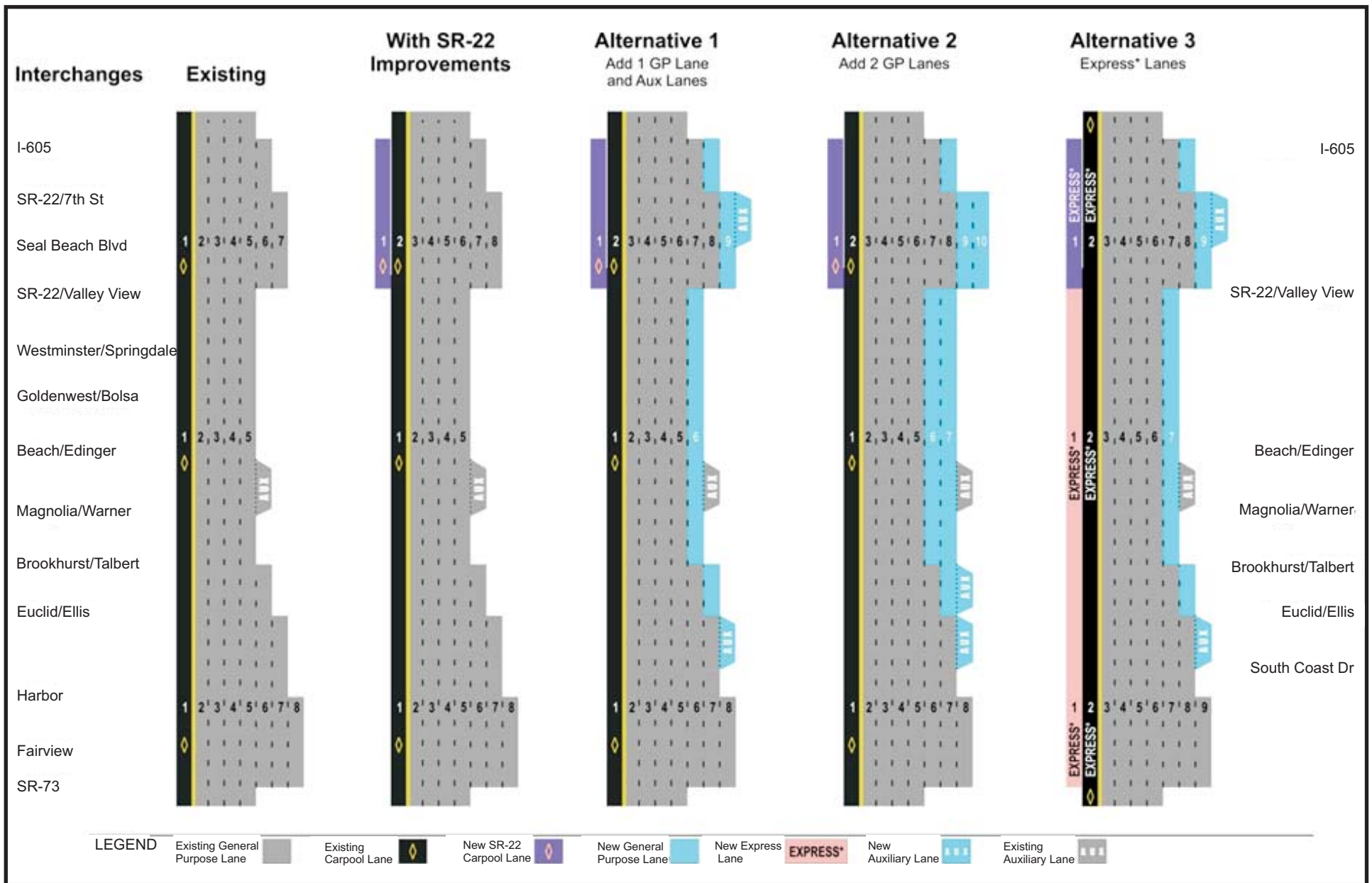


I-405 Improvement Project
Air Quality Report

PARSONS

FIGURE 1-1

PROJECT LOCATION



SOURCE: PARSONS



FIGURE 1-2

ROADWAY CONFIGURATIONS

- Goldenwest Street
 - Edwards Street
 - Westminster Boulevard
 - Springdale Street
 - Bolsa Chica Road
- The Euclid Street/Ellis Avenue undercrossing bridge would be modified and extended.
 - Two railroad overheads would be modified and extended.¹
 - Each build alternative would include interchange reconfigurations at Euclid Street, Ellis Avenue, Brookhurst Street, Magnolia Street, Warner Avenue, Beach Boulevard, and Westminster Boulevard.
 - Maintenance vehicle pullouts (MVP) would be included in various locations under each build alternative.

Unique Features of Build Alternatives

Alternative 1 – Add One General Purpose (GP) Lane in Each Direction

Alternative 1 would add a single GP lane in each direction of I-405 from Euclid Street to the I-605 interchange.

Alternative 1 would provide a full standard highway cross section, with 12-foot-wide mainline travel lanes as well as 10-foot-wide shoulders on both left (inside) and right (outside) sides in both directions.

Alternative 2 – Add Two GP Lanes in Each Direction

Alternative 2 would add one GP lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternative 1), plus add a second GP lane in the northbound direction from Brookhurst Street to the SR-22/7th Street interchange and a second GP lane in the southbound direction from the Seal Beach Boulevard on-ramp to Brookhurst Street.

Alternative 2 would provide a full standard highway cross section, with 12-foot-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right side (outside) shoulders would be 10-feet-wide, while left side (inside) shoulders would have a maximum width of 10 feet with a provision for a widened left shoulder for HOV enforcement areas under consideration.

Alternative 3 – Express Facility

Alternative 3 would add one GP lane in each direction of I-405 from Euclid Street to the I-605 interchange (as in Alternatives 1 and 2), plus add a tolled express lane in each direction of I-405 from SR-73 to I-605. The tolled express lane would be placed beside the existing HOV lane in

¹The freeway passes over the Union Pacific Railroad (UPRR) on the Bolsa Overhead (Bridge No. 55-269 at PM 17.21) and the U.S. Navy Railroad on the Navy Overhead (Bridge No. 55-272 at PM 18.36).

each direction. The existing HOV lanes and new toll lanes would be managed jointly as an Express Lane Facility with two lanes in each direction.

Alternative 3 would provide a full standard highway cross section, with 12-foot-wide mainline travel lanes and shoulders on the left and right sides in both directions. Right side (outside) shoulders would be 10-feet-wide, while left side (inside) shoulders would have a maximum width of 10 feet with a provision for a widened left shoulder for enforcement areas under consideration. The joint HOV/toll lane Express Lane Facility would be separated from the GP lanes by a 1- to 4-foot buffer.

No Build (No Action) Alternative

The No Build Alternative provides a “baseline” for comparing impacts associated with the build alternatives because environmental review must consider the effects of not implementing the proposed project. The Project Baseline conditions under the No Build Alternative would provide no additional lanes or interchange improvements to the I-405 corridor. The project area would continue to operate with no additional improvements and would not achieve the project’s stated purpose and need.

1.3 TRAFFIC DATA

Emission estimations in the Air Quality Report are based on traffic data prepared for the proposed project. **Tables 1-1** through **1-3** show I-405 average daily traffic, truck percentages, and truck volumes. **Tables 1-4** through **1-6** show I-405 vehicle speeds in each freeway direction for GP and HOV lanes. **Tables 1-7** through **1-15** show mainline level of service (LOS), and **Tables 1-16** through **1-20** show LOS data at on- and off-ramps and nearby intersections. **Table 1-21** shows mainline vehicle hours traveled (VHT).

TABLE 1-1: EXISTING TRAFFIC VOLUMES

Location	Average Daily Traffic	% Trucks	Truck Volume
SR-22 East – I-605	370,260	3.0	11,108
Brookhurst Street – SR-22 East	257,400	3.5	9,009
SR-73 – Brookhurst Street	306,900	3.5	10,742
SOURCE: Albert Grover & Associates, 2011.			

TABLE 1-2: FUTURE TRAFFIC VOLUMES – OPENING DAY (YEAR 2020)

Location	2020 No Build			2020 Build			Truck % Change
	ADT	% Trucks	Truck Volume	ADT	% Trucks	Truck Volume	
Alternative 1							
SR-22 East – I-605	404,000	3.0	12,120	433,000	3.0	12,990	7.18
Brookhurst Street – SR-22 East	276,000	3.5	9,660	296,000	3.5	10,360	7.25
SR-73 – Brookhurst Street	333,000	3.5	11,655	357,000	3.5	12,495	7.21
Alternative 2							
SR-22 East – I-605	404,000	3.0	12,120	453,000	3.0	13,950	15.10
Brookhurst Street – SR-22 East	276,000	3.5	9,660	310,000	3.5	10,850	12.32
SR-73 – Brookhurst Street	333,000	3.5	11,655	374,000	3.5	13,090	12.31

TABLE 1-2: FUTURE TRAFFIC VOLUMES – OPENING DAY (YEAR 2020)

Location	2020 No Build			2020 Build			Truck % Change
	ADT	% Trucks	Truck Volume	ADT	% Trucks	Truck Volume	
Alternative 3							
SR-22 East – I-605	404,000	3.0	12,120	455,000	3.0	13,650	12.62
Brookhurst Street – SR-22 East	276,000	3.5	9,660	314,000	3.5	10,990	13.77
SR-73 – Brookhurst Street	333,000	3.5	11,655	383,000	3.5	13,405	15.02
SOURCE: Albert Grover & Associates, 2011.							

TABLE 1-3: FUTURE TRAFFIC VOLUMES – DESIGN DAY (YEAR 2040)

Location	2040 No Build			2040 Build			Truck % Change
	ADT	% Trucks	Truck Volume	ADT	% Trucks	Truck Volume	
Alternative 1							
SR-22 East – I-605	427,000	3.0	12,810	475,000	3.0	14,250	11.24
Brookhurst Street – SR-22 East	288,000	3.5	10,080	321,000	3.5	11,235	11.46
SR-73 – Brookhurst Street	351,000	3.5	12,285	391,000	3.5	13,685	11.40
Alternative 2							
SR-22 East – I-605	427,000	3.0	12,810	509,000	3.0	15,270	19.20
Brookhurst Street – SR-22 East	288,000	3.5	10,080	344,000	3.5	12,040	19.44
SR-73 – Brookhurst Street	351,000	3.5	12,285	419,000	3.5	14,665	19.37
Alternative 3							
SR-22 East – I-605	427,000	3.0	12,810	512,000	3.0	15,360	19.91
Brookhurst Street – SR-22 East	288,000	3.5	10,080	352,000	3.5	12,320	22.22
SR-73 – Brookhurst Street	351,000	3.5	12,285	435,000	3.5	15,225	23.93
SOURCE: Albert Grover & Associates, 2011.							

TABLE 1-4: I-405 VEHICLE SPEEDS – EXISTING CONDITIONS

Scenario	Speed (Miles Per Hour)			
	Northbound		Southbound	
	General Purpose Lanes	High Occupancy Vehicle Lanes	General Purpose Lanes	High Occupancy Vehicle Lanes
Existing Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	35	55	31	51
Brookhurst Street – SR-22 East	43	53	17	47
SR-73 – Brookhurst Street	65	65	45	55
Existing Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	47	55	45	55
Brookhurst Street – SR-22 East	45	55	50	60
SR-73 – Brookhurst Street	30	40	53	63
Existing Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
SOURCE: Albert Grover & Associates, 2011.				

TABLE 1-5: I-405 VEHICLE SPEEDS – OPENING DAY (YEAR 2020)

Scenario	Speed (Miles Per Hour)			
	Northbound		Southbound	
	General Purpose Lanes	High Occupancy Vehicle Lanes	General Purpose Lanes	High Occupancy Vehicle Lanes
No Build Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	35	55	31	51
Brookhurst Street – SR-22 East	43	53	17	47
SR-73 – Brookhurst Street	65	65	45	55
No Build Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	47	55	45	55
Brookhurst Street – SR-22 East	45	55	50	60
SR-73 – Brookhurst Street	30	40	53	63
No Build Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
Alternative 1 Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	58	58	18	18
Brookhurst Street – SR-22 East	44	44	33	33
SR-73 – Brookhurst Street	43	53	42	52
Alternative 1 Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	42	42	52	52
Brookhurst Street – SR-22 East	33	33	44	44
SR-73 – Brookhurst Street	45	54	45	54
Alternative 1 Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
Alternative 2 Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	60	60	22	22
Brookhurst Street – SR-22 East	62	62	51	51
SR-73 – Brookhurst Street	53	60	51	57
Alternative 2 Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	47	47	56	56
Brookhurst Street – SR-22 East	56	56	56	56
SR-73 – Brookhurst Street	55	62	55	60
Alternative 2 Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
Alternative 3 Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	64	65	37	65
Brookhurst Street – SR-22 East	58	65	45	65
SR-73 – Brookhurst Street	47	65	43	65
Alternative 3 Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	58	65	62	65
Brookhurst Street – SR-22 East	51	65	51	65
SR-73 – Brookhurst Street	48	65	46	65

TABLE 1-5: I-405 VEHICLE SPEEDS – OPENING DAY (YEAR 2020)

Scenario	Speed (Miles Per Hour)			
	Northbound		Southbound	
	General Purpose Lanes	High Occupancy Vehicle Lanes	General Purpose Lanes	High Occupancy Vehicle Lanes
Alternative 3 Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
SOURCE: Albert Grover & Associates, 2011.				

TABLE 1-6: I-405 VEHICLE SPEEDS – DESIGN DAY (YEAR 2040)

Scenario	Speed (Miles Per Hour)			
	Northbound		Southbound	
	General Purpose Lanes	High Occupancy Vehicle Lanes	General Purpose Lanes	High Occupancy Vehicle Lanes
No Build Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	21	21	5	5
Brookhurst Street – SR-22 East	5	5	5	5
SR-73 – Brookhurst Street	7	15	5	10
No Build Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	10	10	20	20
Brookhurst Street – SR-22 East	5	5	6	6
SR-73 – Brookhurst Street	7	15	8	19
No Build Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
Alternative 1 Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	38	38	6	6
Brookhurst Street – SR-22 East	19	19	11	11
SR-73 – Brookhurst Street	19	28	13	20
Alternative 1 Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	18	18	34	34
Brookhurst Street – SR-22 East	12	12	24	24
SR-73 – Brookhurst Street	19	27	23	32
Alternative 1 Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
Alternative 2 Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	44	44	7	7
Brookhurst Street – SR-22 East	45	45	31	31
SR-73 – Brookhurst Street	29	39	21	27
Alternative 2 Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	22	22	39	39
Brookhurst Street – SR-22 East	35	35	50	50
SR-73 – Brookhurst Street	31	40	34	40
Alternative 2 Non-Peak Periods				

TABLE 1-6: I-405 VEHICLE SPEEDS – DESIGN DAY (YEAR 2040)

Scenario	Speed (Miles Per Hour)			
	Northbound		Southbound	
	General Purpose Lanes	High Occupancy Vehicle Lanes	General Purpose Lanes	High Occupancy Vehicle Lanes
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
Alternative 3 Morning Peak Period (6:00 - 9:00 AM)				
SR-22 East – I-605	53	65	14	65
Brookhurst Street – SR-22 East	38	65	25	65
SR-73 – Brookhurst Street	22	65	14	65
Alternative 3 Evening Peak Period (3:00 - 7:00 PM)				
SR-22 East – I-605	36	65	50	65
Brookhurst Street – SR-22 East	29	65	43	65
SR-73 – Brookhurst Street	22	65	24	65
Alternative 3 Non-Peak Periods				
SR-22 East – I-605	65	65	65	65
Brookhurst Street – SR-22 East	65	65	65	65
SR-73 – Brookhurst Street	65	65	65	65
SOURCE: Albert Grover & Associates, 2011.				

TABLE 1-7: MAINLINE LOS SUMMARY – EXISTING CONDITIONS

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	D	F
		SB	F	D
	HOV	NB	B	E
		SB	B	C
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	D	F
		SB	F	C
	HOV	NB	B	F
		SB	B	C
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	D	F
		SB	F	D
	HOV	NB	B	E
		SB	B	C
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	D	F
		SB	F	D
	HOV	NB	B	E
		SB	D	D
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	F
		SB	D	C
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	D	C
		SB	C	D

TABLE 1-7: MAINLINE LOS SUMMARY – EXISTING CONDITIONS

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	F
		SB	D	E
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	C	F
		SB	C	D
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	F	F
		SB	F	F
	HOV	NB	C	F
		SB	C	D
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	D	F
		SB	C	D
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	D	F
I-605 to San Gabriel River	GP	NB	F	C
		SB	D	F
	HOV	NB	D	D
		SB	B	E
SR-73 — Bear Street to I-405	GP	NB	B	C
		SB	B	B
I-605 — I-405 to Katella Avenue	GP	NB	C	C
		SB	F	F

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-8: MAINLINE LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	D	F
		SB	F	F
	HOV	NB	D	F
		SB	F	F
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Euclid Street/Ellis Avenue to	GP	NB	F	F

TABLE 1-8: MAINLINE LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Brookhurst Street/Talbert Avenue	HOV	SB	F	F
		NB	F	F
		SB	F	F
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	SB	F	F
		NB	F	F
	HOV	SB	F	F
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	SB	F	F
		NB	F	F
	HOV	SB	F	F
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	SB	F	F
		NB	F	F
	HOV	SB	F	F
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
I-605 to San Gabriel River	GP	SB	F	F
		NB	F	F
	HOV	SB	F	F
SR-73 — Bear Street to I-405	GP	NB	C	C
		SB	C	B
I-605 — I-405 to Katella Avenue	GP	NB	C	C
		SB	D	C

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-9: MAINLINE LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F

TABLE 1-9: MAINLINE LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2040)				
Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
I-605 to San Gabriel River	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
SR-73 — Bear Street to I-405	GP	NB	C	C

TABLE 1-9: MAINLINE LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
		SB	D	C
I-605 — I-405 to Katella Avenue	GP	NB	C	F
		SB	F	D

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-10: MAINLINE LOS SUMMARY – ALTERNATIVE 1 (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	D	F
		SB	F	F
	HOV	NB	D	F
		SB	F	F
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	D	F
		SB	F	F
	HOV	NB	D	F
		SB	F	F
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F

TABLE 1-10: MAINLINE LOS SUMMARY – ALTERNATIVE 1 (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
		SB	F	F
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
		SOURCE: Albert Grover & Associates, 2011.		

TABLE 1-11: MAINLINE LOS SUMMARY – ALTERNATIVE 1 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Bolsa Chica Road/Valley View Street	GP	NB	F	F

TABLE 1-11: MAINLINE LOS SUMMARY – ALTERNATIVE 1 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
to Seal Beach Boulevard	HOV	SB	F	F
		NB	F	F
		SB	F	F
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-12: MAINLINE LOS SUMMARY – ALTERNATIVE 2 (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	D	F
		SB	F	F
	HOV	NB	D	F
		SB	F	F
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	D	F
		SB	F	F
	HOV	NB	D	F
		SB	F	F
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	D	F
		SB	F	D
	HOV	NB	D	F
		SB	F	D
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	D	F
		SB	D	F
	HOV	NB	D	F
		SB	D	F
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	D	F
		SB	D	D
	HOV	NB	D	F
		SB	D	D
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	D	F
		SB	D	D
	HOV	NB	D	F

TABLE 1-12: MAINLINE LOS SUMMARY – ALTERNATIVE 2 (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
		SB	D	D
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	D	D
		SB	D	D
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	D	D
		SB	F	F

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-13: MAINLINE LOS SUMMARY – ALTERNATIVE 2 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to Fairview Road	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
Springdale Street/Westminster	GP	NB	F	F

TABLE 1-13: MAINLINE LOS SUMMARY – ALTERNATIVE 2 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Boulevard to Bolsa Chica Road/Valley View Street	HOV	SB	F	F
		NB	F	F
		SB	F	F
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
Seal Beach Boulevard to I-605	GP	SB	F	F
		NB	F	F
	HOV	NB	F	F
		SB	F	F

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-14: MAINLINE LOS SUMMARY – ALTERNATIVE 3 (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to SR-73	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
SR-73 to Fairview Road (Express – HOV Transition)	GP	NB	D	D
		SB	F	D
	Express/HOV	NB	F	F
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	D	D
		SB	F	D
	HOV	NB	C	C
		SB	C	C
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	D	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	C	D
		SB	F	D
	HOV	NB	C	C
		SB	C	C
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C

TABLE 1-14: MAINLINE LOS SUMMARY – ALTERNATIVE 3 (YEAR 2020)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	SB	C	C
		NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
		NB	F	F
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	SB	F	F
		NB	C	C
		SB	C	C
	HOV	NB	C	C
		SB	C	C
		NB	F	F
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	SB	F	F
		NB	D	D
		SB	D	D
	HOV	NB	D	D
		SB	D	D
		NB	F	F
Seal Beach Boulevard to I-605	GP	SB	F	F
		NB	D	D
		SB	D	D
	HOV	NB	D	D
		SB	D	D
		NB	F	F
I-605 to San Gabriel River	GP	SB	F	F
		NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
		NB	F	F
SR-73 – Bear Street to Fairview Road Ramp	GP	NB	C	C
		SB	C	B
SR-73 – Fairview Road Ramp to I-405	GP	NB	B	F
		SB	C	B
		NB	B	C
	HOV	SB	C	C
		NB	C	C
		SB	C	C
I-605 – I-405 to Express/HOV Transition	GP	NB	C	C
		SB	D	C
		NB	C	C
	Express/HOV	SB	D	C
		NB	C	C
		SB	D	C
I-605 – Express/HOV Transition to Katella Avenue	GP	NB	C	F
		SB	D	C
		NB	C	F
	HOV	SB	D	C
		NB	C	F
		SB	D	C

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-15: MAINLINE LOS SUMMARY – ALTERNATIVE 3 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Bristol Street to SR-73	GP	NB	F	F
		SB	F	F
		NB	F	F
	HOV	SB	F	F
		NB	F	F
		SB	F	F
SR-73 to Fairview Road (Express – HOV Transition)	GP	NB	F	F
		SB	F	F
		NB	F	F
	Express/HOV	SB	F	F
		NB	F	F
		SB	F	F

TABLE 1-15: MAINLINE LOS SUMMARY – ALTERNATIVE 3 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
		SB	F	F
Fairview Road to Harbor Boulevard/Hyland Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Harbor Boulevard/Hyland Avenue to Euclid Street/Ellis Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Euclid Street/Ellis Avenue to Brookhurst Street/Talbert Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Brookhurst Street/Talbert Avenue to Magnolia Street/Warner Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Magnolia Street/Warner Avenue to Beach Boulevard/Edinger Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Beach Boulevard/Edinger Street to Goldenwest Street/Bolsa Avenue	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Goldenwest Street/Bolsa Avenue to Springdale Street/Westminster Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Springdale Street/Westminster Boulevard to Bolsa Chica Road/Valley View Street	GP	NB	F	F
		SB	F	F
	HOV	NB	C	C
		SB	C	C
Bolsa Chica Road/Valley View Street to Seal Beach Boulevard	GP	NB	F	F
		SB	F	F
	HOV	NB	D	D
		SB	D	D

TABLE 1-15: MAINLINE LOS SUMMARY – ALTERNATIVE 3 (YEAR 2040)

Location	Lane Type	Direction	AM Peak Hour	PM Peak Hour
Seal Beach Boulevard to I-605	GP	NB	F	F
		SB	F	F
	HOV	NB	D	D
		SB	D	D
I-605 to San Gabriel River	GP	NB	F	F
		SB	F	F
	HOV	NB	F	F
		SB	F	F
SR-73 – Bear Street to Fairview Road Ramp	GP	NB	C	D
		SB	D	C
SR-73 – Fairview Road Ramp to I-405	GP	NB	B	F
		SB	C	B
	HOV	NB	B	C
		SB	C	C
I-605 – I-405 to Express/HOV Transition	GP	NB	C	F
		SB	F	D
	Express/HOV	NB	C	D
		SB	E	D
I-605 – Express/HOV Transition to Katella Avenue	GP	NB	C	F
		SB	F	D
	HOV	NB	C	F
		SB	E	D

SOURCE: Albert Grover & Associates, 2011.

TABLE 1-16: INTERSECTION LOS SUMMARY – EXISTING CONDITIONS

Location	AM Peak Hour	PM Peak Hour
Bristol Street Interchange		
Anton/South Coast Plaza & Bristol Street	B	C
I-405 NB Off-Ramp/South Coast Plaza & Bristol Street	B	C
I-405 NB On-Ramp (for NB Bristol Street) & Bristol Street	--	--
I-405 NB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB Off-Ramp & On-Ramp (for NB Bristol Street) & Bristol Street	B	B
Fairview Road Interchange		
I-405 NB Ramps & Fairview Road	C	C
I-405 SB Ramps & Fairview Road	B	C
South Coast Drive & I-405 NB Off-Ramp	C	C
Harbor Boulevard & Hyland Avenue Interchange		
I-405 NB On-Ramp/South Coast Dr & Hyland Avenue	A	A
I-405 SB On-Ramp (for SB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 NB Off-Ramp & Harbor Boulevard	B	C
I-405 NB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 SB Off-Ramp & Harbor Boulevard	B	B
I-405 SB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
Gisler Avenue & Harbor Boulevard	C	C
Ikea Way & Susan Street	A	A

TABLE 1-16: INTERSECTION LOS SUMMARY – EXISTING CONDITIONS

Location	AM Peak Hour	PM Peak Hour
Euclid Street & Ellis Avenue Interchange		
I-405 NB Ramps/Newhope Street & Euclid Street	C	D
Ellis Avenue I-405 SB Ramps	D	D
Brookhurst Street & Talbert Avenue Interchange		
Slater Avenue & Brookhurst Street	D	D
I-405 NB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to NB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB On-Ramp (for NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to SB Brookhurst Street) & Brookhurst Street	--	--
Talbert Avenue & Brookhurst Street	D	D
Talbert Avenue & I-405 SB On-Ramp (for EB Talbert Avenue)	--	--
Magnolia Street & Warner Avenue Interchange		
Heil Avenue & Magnolia Street	C	B
I-405 NB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB Off-Ramp (to NB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB On-Ramp (for NB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB Off-Ramp (to NB & SB Magnolia Avenue) & Magnolia Street	A	B
Warner Avenue & Magnolia Street	D	D
Warner Avenue & I-405 SB On-Ramp (for EB Warner Avenue)	--	--
Warner Avenue & I-405 SB Off-Ramp (to EB Warner Avenue)	--	--
Warner Avenue & I-405 NB Off-Ramp (to WB Warner Avenue)	--	--
Warner Avenue & I-405 NB On-Ramp (for WB Warner Avenue)	--	--
Beach Boulevard & Edinger Avenue Interchange		
McFadden Avenue & Beach Boulevard	D	E
I-405 NB On-Ramp (for SB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB Off-Ramp (to NB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB Off-Ramp (to SB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB On-Ramp (for NB Beach Boulevard) & Beach Boulevard	--	--
Center Avenue & Beach Boulevard	B	B
Center Avenue (Huntington Beach Mall) & I-405 SB Ramps	B	C
I-405 SB Off-Ramp (to NB Beach Boulevard) & Beach Boulevard	--	--
Edinger Avenue & Beach Boulevard	E	E
Edinger Avenue & I-405 SB On-Ramp	--	--
Goldenwest Street & Bolsa Avenue Interchange		
I-405 NB On-Ramp (for NB Goldenwest Street) & Goldenwest Street	--	--
Westminster Mall & I-405 SB Ramps	A	A
Westminster Mall & Goldenwest Street	A	B
Bolsa Avenue & Goldenwest Street	D	D
Bolsa Avenue & I-405 SB On-Ramp (for EB Bolsa Avenue)	--	--
Bolsa Avenue & I-405 SB Off-Ramp (to EB Bolsa Avenue)	B	B
Bolsa Avenue & I-405 NB Off-Ramp (to WB Bolsa Avenue)	--	--
Springdale Street & Westminster Boulevard Interchange		
I-405 SB Off-Ramp & Springdale Street	D	E

TABLE 1-16: INTERSECTION LOS SUMMARY – EXISTING CONDITIONS

Location	AM Peak Hour	PM Peak Hour
Westminster Boulevard & Springdale Street	D	D
Westminster Boulevard & I-405 SB On-Ramp	--	--
Westminster Boulevard & I-405 SB Off-Ramp (to EB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB Off-Ramp (to WB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB On-Ramp	--	--
Westminster Boulevard & I-405 NB Off-Ramp/Willow Lane	B	B
Bolsa Chica Road – Valley View Street & Garden Grove Boulevard Interchange		
Garden Grove Boulevard & I-405 NB Off-Ramp/SR-22 EB Ramps	D	D
Garden Grove Boulevard & Bolsa Chica Rd/Valley View Street	C	F
I-405 SB On-Ramp (for SB Bolsa Chica Rd) & Bolsa Chica Rd	--	--
I-405 SB Off-Ramp (to SB Bolsa Chica Rd) & Bolsa Chica Rd	--	--
SR-22 WB/I-405 NB On-Ramp (for SB Valley View St) & Valley View Street	--	--
SR-22 WB/I-405 NB On-Ramp (for NB Valley View St) & Valley View Street	--	--
Seal Beach Boulevard Interchange		
I-405 NB Ramps & Seal Beach Boulevard	C	C
I-405 SB Ramps & Seal Beach Boulevard	D	F
Bear Street Interchange at SR-73		
SR-73 NB Ramps & Bear Street	B	B
SR-73 SB Ramps & Bear Street	B	B
Katella Avenue/Willow Street Interchange at I-605		
Katella Avenue & I-605 NB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 NB On-Ramp (for EB Katella Avenue)	A	A
Katella Avenue & I-605 NB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 NB Off-Ramp (to WB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 SB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for EB Katella Avenue)	--	--
Willow Street & I-605 SB Off-Ramp (to WB Willow St)	--	--
SOURCE: Albert Grover & Associates, 2011.		

TABLE 1-17: INTERSECTION LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2020)

Location	AM Peak Hour	PM Peak Hour
Bristol Street Interchange		
I-405 NB Off-Ramp/South Coast Plaza & Bristol Street	B	D
I-405 NB On-Ramp (for NB Bristol Street) & Bristol Street	--	--
I-405 NB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB Off-Ramp & On-Ramp (for NB Bristol Street) & Bristol Street	B	B
Fairview Road Interchange		
I-405 NB Ramps & Fairview Road	F	D
I-405 SB Ramps & Fairview Road	C	C
South Coast Drive & I-405 NB Off-Ramp	C	C
Harbor Boulevard & Hyland Avenue Interchange		
I-405 NB On-Ramp/South Coast Drive & Hyland Avenue	A	A
I-405 SB On-Ramp (for SB Harbor Boulevard) & Harbor Boulevard	--	--

TABLE 1-17: INTERSECTION LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2020)

Location	AM Peak Hour	PM Peak Hour
I-405 NB Off-Ramp & Harbor Boulevard	C	C
I-405 NB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 SB Off-Ramp & Harbor Boulevard	B	B
I-405 SB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
Gisler Avenue & Harbor Boulevard	C	D
Ikea Way & Susan Street	A	A
Euclid Street & Ellis Avenue Interchange		
I-405 NB Ramps/Newhope Street & Euclid Street	C	D
Ellis Avenue & I-405 SB Ramps	F	F
Brookhurst Street & Talbert Avenue Interchange		
Slater Avenue & Brookhurst Street	F	D
I-405 NB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to NB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB On-Ramp (for NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to SB Brookhurst Street) & Brookhurst Street	--	--
Talbert Avenue & Brookhurst Street	F	E
Talbert Avenue & I-405 SB On-Ramp (for EB Talbert Avenue)	--	--
Magnolia Street & Warner Avenue Interchange		
Heil Avenue & Magnolia Street	C	B
I-405 NB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB Off-Ramp (to NB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB On-Ramp (for NB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB Off-Ramp (to NB & SB Magnolia Avenue) & Magnolia Street	A	B
Warner Avenue & Magnolia Street	D	F
Warner Avenue & I-405 SB On-Ramp (for EB Warner Avenue)	--	--
Warner Avenue & I-405 SB Off-Ramp (to EB Warner Avenue)	--	--
Warner Avenue & I-405 NB Off-Ramp (to WB Warner Avenue)	--	--
Warner Avenue & I-405 NB On-Ramp (for WB Warner Avenue)	--	--
Beach Boulevard & Edinger Avenue Interchange		
McFadden Avenue & Beach Boulevard	F	F
I-405 NB On-Ramp (for SB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB Off-Ramp (to NB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB Off-Ramp (to SB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB On-Ramp (for NB Beach Boulevard) & Beach Boulevard	--	--
Center Avenue & Beach Boulevard	B	C
Center Avenue (Huntington Beach Mall) & I-405 SB Ramps	B	C
I-405 SB Off-Ramp (to NB Beach Boulevard) & Beach Boulevard	--	--
Edinger Avenue & Beach Boulevard	F	F
Edinger Avenue & I-405 SB On-Ramp	--	--
Goldenwest Street & Bolsa Avenue Interchange		
I-405 NB On-Ramp (for NB Goldenwest Street) & Goldenwest Street	--	--
Westminster Mall & I-405 SB Ramps	A	A

TABLE 1-17: INTERSECTION LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2020)

Location	AM Peak Hour	PM Peak Hour
Westminster Mall & Goldenwest Street	B	B
Bolsa Avenue & Goldenwest Street	D	F
Bolsa Avenue & I-405 SB On-Ramp (for EB Bolsa Avenue)	--	--
Bolsa Avenue & I-405 SB Off-Ramp (to EB Bolsa Avenue)	B	B
Bolsa Avenue & I-405 NB Off-Ramp (to WB Bolsa Avenue)	--	--
Springdale Street & Westminster Boulevard Interchange		
I-405 SB Off-Ramp & Springdale Street	E	E
Westminster Boulevard & Springdale Street	D	E
Westminster Boulevard & I-405 SB On-Ramp	--	--
Westminster Boulevard & I-405 SB Off-Ramp (to EB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB Off-Ramp (to WB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB On-Ramp	--	--
Westminster Boulevard & I-405 NB Off-Ramp/Willow Lane	B	B
Bolsa Chica Road – Valley View Street & Garden Grove Boulevard Interchange		
Garden Grove Boulevard & I-405 NB Off-Ramp/SR-22 EB Ramps	E	E
Garden Grove Boulevard & Bolsa Chica Road/Valley View Street	C	F
I-405 SB On-Ramp (for SB Bolsa Chica Road) & Bolsa Chica Road	--	--
I-405 SB Off-Ramp (to SB Bolsa Chica Road) & Bolsa Chica Road	--	--
SR-22 WB/I-405 NB On-Ramp (for SB Valley View Street) & Valley View Street	--	--
SR-22 WB/I-405 NB On-Ramp (for NB Valley View Street) & Valley View Street	--	--
Seal Beach Boulevard Interchange		
I-405 NB Ramps & Seal Beach Boulevard	C	C
I-405 SB Ramps & Seal Beach Boulevard	F	F
Bear Street Interchange at SR-73		
SR-73 NB Ramps & Bear Street	B	B
SR-73 SB Ramps & Bear Street	B	B
Katella Avenue/Willow Street Interchange at I-605		
Katella Avenue & I-605 NB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 NB On-Ramp (for EB Katella Avenue)	A	A
Katella Avenue & I-605 NB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 NB Off-Ramp (to WB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 SB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for EB Katella Avenue)	--	--
Willow Street & I-605 SB Off-Ramp (to WB Willow Street)	--	--
SOURCE: Albert Grover & Associates, 2011.		

TABLE 1-18: INTERSECTION LOS SUMMARY – BUILD ALTERNATIVE (YEAR 2020)

Location	AM Peak Hour	PM Peak Hour
Bristol Street Interchange		
I-405 NB Off-Ramp/South Coast Plaza & Bristol Street	B	D
I-405 NB On-Ramp (for NB Bristol Street) & Bristol Street	--	--
I-405 NB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB Off-Ramp & On-Ramp (for NB Bristol Street) & Bristol Street	B	B

TABLE 1-18: INTERSECTION LOS SUMMARY – BUILD ALTERNATIVE (YEAR 2020)		
Location	AM Peak Hour	PM Peak Hour
Fairview Road Interchange		
I-405 NB Ramps & Fairview Road	F	C
I-405 SB Ramps & Fairview Road	C	C
Harbor Boulevard & Hyland Avenue Interchange		
I-405 NB On-Ramp/South Coast Dr & Hyland Avenue	A	A
I-405 SB On-Ramp (for SB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 NB Off-Ramp & Harbor Boulevard	B	C
I-405 NB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 SB Off-Ramp & Harbor Boulevard	B	B
I-405 SB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
Gisler Avenue & Harbor Boulevard	C	C
Ikea Way & Susan Street	A	A
Euclid Street & Ellis Avenue Interchange		
I-405 NB Ramps/Newhope Street Euclid Street	C	D
Ellis Avenue (WBR to SB On-Ramp) & I-405 SB Ramps (I-405 SB On-Ramp is for WB Ellis Avenue)	B	B
Ellis Avenue (EBT to SB On-Ramp) & I-405 SB On-Ramp (for EB Ellis Avenue)	--	--
Brookhurst Street & Talbert Avenue Interchange		
Slater Avenue & Brookhurst Street	F	D
I-405 NB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to NB & SB Brookhurst Street) & Brookhurst Street	B	B
I-405 NB On-Ramp (for NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to NB & SB Brookhurst Street) & Brookhurst Street	B	B
Talbert Avenue & Brookhurst Street	F	D
Talbert Avenue & I-405 SB On-Ramp (for EB Talbert Avenue)	--	--
Magnolia Street & Warner Avenue Interchange		
Heil Avenue & Magnolia Street	C	B
I-405 NB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB Off-Ramp (to NB Magnolia Avenue) & Magnolia Street	A	A
I-405 NB On-Ramp (for NB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB Off-Ramp (to NB & SB Magnolia Avenue) & Magnolia Street	A	B
Warner Avenue & Magnolia Street	D	D
Warner Avenue & I-405 SB On-Ramp (for EB Warner Avenue)	--	--
Warner Avenue & I-405 SB Off-Ramp (to EB Warner Avenue)	--	--
Warner Avenue & I-405 NB Off-Ramp (to WB Warner Avenue)	--	--
Warner Avenue & I-405 NB On-Ramp (for WB Warner Avenue)	--	--
Beach Boulevard & Edinger Avenue Interchange		
McFadden Avenue & Beach Boulevard	F	F
I-405 NB Ramps (for NB and SB Beach Boulevard) & Beach Boulevard	B	B
Center Avenue & Beach Boulevard	B	B
Center Avenue (Huntington Beach Mall) & I-405 SB Ramps	B	C
Edinger Avenue & Beach Boulevard	D	E
Edinger Avenue & I-405 SB On-Ramp	--	--
Goldenwest Street & Bolsa Avenue Interchange		
I-405 NB On-Ramp (for NB Goldenwest Street) & Goldenwest Street	--	--

TABLE 1-18: INTERSECTION LOS SUMMARY – BUILD ALTERNATIVE (YEAR 2020)

Location	AM Peak Hour	PM Peak Hour
Westminster Mall & I-405 SB Ramps	B	B
Westminster Mall & Goldenwest Street	A	A
Bolsa Avenue & Goldenwest Street	D	D
Bolsa Avenue & I-405 SB On-Ramp (for EB Bolsa Avenue)	--	--
Bolsa Avenue & I-405 SB Off-Ramp (to EB Bolsa Avenue)	B	B
Bolsa Avenue & I-405 NB Off-Ramp (to WB Bolsa Avenue)	--	--
Option B		
Westminster Mall & I-405 SB Ramps	--	--
Springdale Street & Westminster Boulevard Interchange		
I-405 SB Off-Ramp & Springdale Street	A	A
Westminster Boulevard & Springdale Street	D	D
Westminster Boulevard & I-405 SB On-Ramp	--	--
Westminster Boulevard & I-405 SB Off-Ramp (to EB Westminster Boulevard)	--	--
Option A		
Westminster Boulevard & I-405 NB Ramps (to WB & EB Westminster Boulevard)	B	B
Westminster Boulevard & Willow Lane	C	C
Option B		
Westminster Boulevard & I-405 NB Off-Ramp (to WB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB On-Ramp	--	--
Westminster Boulevard & I-405 NB Off-Ramp/Willow Lane	--	--
Bolsa Chica Road – Valley View Street & Garden Grove Boulevard Interchange		
Garden Grove Boulevard & I-405 NB Off-Ramp/SR-22 EB Ramps	D	D
Garden Grove Boulevard & Bolsa Chica Road/Valley View Street	C	C
I-405 SB Ramps (to NB & SB Bolsa Chica Road) & Bolsa Chica Road	B	A
SR-22 WB/I-405 NB On-Ramp (for SB Valley View Street) & Valley View Street	--	--
SR-22 WB/I-405 NB On-Ramp (for NB Valley View Street) & Valley View Street	--	--
Seal Beach Boulevard Interchange		
I-405 NB Ramps & Seal Beach Boulevard	C	C
I-405 SB Ramps & Seal Beach Boulevard	D	D
Bear Street Interchange at SR-73		
SR-73 NB Ramps & Bear Street	B	B
SR-73 SB Ramps & Bear Street	B	B
Katella Avenue/Willow Street Interchange at I-605		
Katella Avenue & I-605 NB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 NB On-Ramp (for EB Katella Avenue)	A	A
Katella Avenue & I-605 NB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 NB Off-Ramp (to WB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 SB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for EB Katella Avenue)	--	--
Willow Street & I-605 SB Off-Ramp (to WB Willow Street)	--	--
SOURCE: Albert Grover & Associates, 2011.		

TABLE 1-19: INTERSECTION LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2040)

Location	AM Peak Hour	PM Peak Hour
Bristol Street Interchange		
Anton Boulevard/South Coast Plaza & Bristol Street	B	D
I-405 NB Off-Ramp/South Coast Plaza & Bristol Street	C	D
I-405 NB On-Ramp (for NB Bristol Street) & Bristol Street	--	--
I-405 NB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB On-Ramp (for SB Bristol Street) & Bristol Street	--	--
I-405 SB Off-Ramp & On-Ramp (for NB Bristol Street) & Bristol Street	B	F
Fairview Road Interchange		
I-405 NB Ramps & Fairview Road	F	D
I-405 SB Ramps & Fairview Road	C	C
South Coast Drive & I-405 NB Off-Ramp	C	C
Harbor Boulevard & Hyland Avenue Interchange		
I-405 NB On-Ramp/South Coast Drive & Hyland Avenue	A	B
I-405 SB On-Ramp (for SB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 NB Off-Ramp & Harbor Boulevard	C	C
I-405 NB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
I-405 SB Off-Ramp & Harbor Boulevard	B	B
I-405 SB On-Ramp (for NB Harbor Boulevard) & Harbor Boulevard	--	--
Gisler Avenue & Harbor Boulevard	C	E
Ikea Way & Susan Street	A	A
Euclid Street & Ellis Avenue Interchange		
I-405 NB Ramps/Newhope Street & Euclid Street	C	D
Ellis Avenue & I-405 SB Ramps	F	F
Brookhurst Street & Talbert Avenue Interchange		
Slater Avenue & Brookhurst Street	F	E
I-405 NB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to NB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB On-Ramp (for NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to SB Brookhurst Street) & Brookhurst Street	--	--
Talbert Avenue & Brookhurst Street	F	F
Talbert Avenue I-405 SB On-Ramp (for EB Talbert Avenue)	--	--
Magnolia Street & Warner Avenue Interchange		
Heil Avenue & Magnolia Street	C	C
I-405 NB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB Off-Ramp (to NB Magnolia Avenue) & Magnolia Street	--	--
I-405 NB On-Ramp (for NB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB On-Ramp (for SB Magnolia Avenue) & Magnolia Street	--	--
I-405 SB Off-Ramp (to NB & SB Magnolia Avenue) & Magnolia Street	B	C
Warner Avenue & Magnolia Street	E	F
Warner Avenue & I-405 SB On-Ramp (for EB Warner Avenue)	--	--
Warner Avenue & I-405 SB Off-Ramp (to EB Warner Avenue)	--	--
Warner Avenue & I-405 NB Off-Ramp (to WB Warner Avenue)	--	--
Warner Avenue & I-405 NB On-Ramp (for WB Warner Avenue)	--	--
Beach Boulevard & Edinger Avenue Interchange		

TABLE 1-19: INTERSECTION LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2040)

Location	AM Peak Hour	PM Peak Hour
McFadden Avenue & Beach Boulevard	F	F
I-405 NB On-Ramp (for SB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB Off-Ramp (to NB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB Off-Ramp (to SB Beach Boulevard) & Beach Boulevard	--	--
I-405 NB On-Ramp (for NB Beach Boulevard) & Beach Boulevard	--	--
Center Avenue & Beach Boulevard	B	F
Center Avenue (Huntington Beach Mall) & I-405 SB Ramps	B	D
I-405 SB Off-Ramp (to NB Beach Boulevard) & Beach Boulevard	--	--
Edinger Avenue & Beach Boulevard	F	F
Edinger Avenue & I-405 SB On-Ramp	--	--
Goldenwest Street & Bolsa Avenue Interchange		
I-405 NB On-Ramp (for NB Goldenwest Street) & Goldenwest Street	--	--
Westminster Mall & I-405 SB Ramps	A	B
Westminster Mall & Goldenwest Street	B	B
Bolsa Avenue & Goldenwest Street	D	F
Bolsa Avenue & I-405 SB On-Ramp (for EB Bolsa Avenue)	--	--
Bolsa Avenue & I-405 SB Off-Ramp (to EB Bolsa Avenue)	B	B
Bolsa Avenue & I-405 NB Off-Ramp (to WB Bolsa Avenue)	--	--
Springdale Street & Westminster Boulevard Interchange		
I-405 SB Off-Ramp & Springdale Street	F	F
Westminster Boulevard & Springdale Street	D	F
Westminster Boulevard & I-405 SB On-Ramp	--	--
Westminster Boulevard & I-405 SB Off-Ramp (to EB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB Off-Ramp (to WB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB On-Ramp	--	--
Westminster Boulevard & I-405 NB Off-Ramp/Willow Lane	B	B
Bolsa Chica Road – Valley View Street & Garden Grove Boulevard Interchange		
Garden Grove Boulevard & I-405 NB Off-Ramp/SR-22 EB Ramps	E	F
Garden Grove Boulevard & Bolsa Chica Road /Valley View Street	C	F
I-405 SB On-Ramp (for SB Bolsa Chica Road) & Bolsa Chica Road	--	--
I-405 SB Off-Ramp (to SB Bolsa Chica Road) & Bolsa Chica Road	--	--
SR-22 WB/I-405 NB On-Ramp (for SB Valley View Street) & Valley View Street	--	--
SR-22 WB/I-405 NB On-Ramp (for NB Valley View Street) & Valley View Street	--	--
Seal Beach Boulevard Interchange		
I-405 NB Ramps & Seal Beach Boulevard	C	D
I-405 SB Ramps & Seal Beach Boulevard	F	F
Bear Street Interchange at SR-73		
SR-73 NB Ramps & Bear Street	B	B
SR-73 SB Ramps & Bear Street	B	B
Katella Avenue/Willow Street Interchange at I-605		
Katella Avenue & I-605 NB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 NB On-Ramp (for EB Katella Avenue)	A	A
Katella Avenue & I-605 NB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 NB Off-Ramp (to WB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 SB Off-Ramp (to EB Katella Avenue)	--	--

TABLE 1-19: INTERSECTION LOS SUMMARY – NO BUILD ALTERNATIVE (YEAR 2040)

Location	AM Peak Hour	PM Peak Hour
Katella Avenue & I-605 SB On-Ramp (for EB Katella Avenue)	--	--
Willow Street & I-605 SB Off-Ramp (to WB Willow Street)	--	--
SOURCE: Albert Grover & Associates, 2011.		

TABLE 1-20: INTERSECTION LOS SUMMARY – BUILD ALTERNATIVE (YEAR 2040)

Location	AM Peak Hour	PM Peak Hour
Euclid Street & Ellis Avenue Interchange		
I-405 NB Ramps/Newhope St & Euclid Street	C	D
Ellis Avenue (WB to SB On-Ramp) & I-405 SB Ramps (I-405 SB On-Ramp is for WB Ellis Avenue)	C	B
Ellis Avenue (EB to SB On-Ramp) & I-405 SB On-Ramp (for EB Ellis Avenue)	--	--
Ellis Avenue & Pacific Street	--	--
Brookhurst Street & Talbert Avenue Interchange		
Slater Avenue & Brookhurst Street	F	D
I-405 NB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 NB Off-Ramp (to NB & SB Brookhurst Street) & Brookhurst Street	B	B
I-405 NB On-Ramp (for NB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB On-Ramp (for SB Brookhurst Street) & Brookhurst Street	--	--
I-405 SB Off-Ramp (to NB & SB Brookhurst Street) & Brookhurst Street	B	B
Talbert Avenue & Brookhurst Street	F	F
Talbert Avenue & I-405 SB On-Ramp (for EB Talbert Avenue)	--	--
Magnolia Street & Warner Avenue Interchange		
Heil Avenue & Magnolia Street	C	C
I-405 NB On-Ramp (for SB Magnolia Street) & Magnolia Street	--	--
I-405 NB Off-Ramp (to NB Magnolia Street) & Magnolia Street	A	A
I-405 NB On-Ramp (for NB Magnolia Street) & Magnolia Street	--	--
I-405 SB On-Ramp (for SB Magnolia Street) & Magnolia Street	--	--
I-405 SB Off-Ramp (to NB & SB Magnolia Street) & Magnolia Street	B	B
Warner Avenue & Magnolia Street	D	F
Warner Avenue & I-405 SB On-Ramp (for EB Warner Avenue)	--	--
Warner Avenue & I-405 SB Off-Ramp (to EB Warner Avenue)	--	--
Warner Avenue & I-405 NB Off-Ramp (to WB Warner Avenue)	--	--
Warner Avenue & I-405 NB On-Ramp (for WB Warner Avenue)	--	--
Beach Boulevard & Edinger Avenue Interchange		
McFadden Avenue & Beach Boulevard	F	F
I-405 NB Ramps (for NB and SB Beach Boulevard) & Beach Boulevard	B	B
Center Avenue & Beach Boulevard	B	C
Center Avenue (Huntington Beach Mall) & I-405 SB Ramps	B	C
Edinger Avenue & Beach Boulevard	F	F
Edinger Avenue & I-405 SB On-Ramp	--	--
Goldenwest Street & Bolsa Avenue Interchange		
I-405 NB On-Ramp (for NB Goldenwest Street) & Goldenwest Street	--	--
Westminster Mall & I-405 SB Ramps	B	B
Westminster Mall & Goldenwest Street	B	A
Bolsa Avenue & Goldenwest Street	D	E

TABLE 1-20: INTERSECTION LOS SUMMARY – BUILD ALTERNATIVE (YEAR 2040)

Location	AM Peak Hour	PM Peak Hour
Bolsa Avenue & I-405 SB On-Ramp (for EB Bolsa Avenue)	--	--
Bolsa Avenue & I-405 SB Off-Ramp (to EB Bolsa Avenue)	B	B
Bolsa Avenue & I-405 NB Off-Ramp (to WB Bolsa Avenue)	--	--
Option B		
Westminster Mall & I-405 SB Ramps	--	--
Springdale Street & Westminster Boulevard Interchange		
I-405 SB Off-Ramp & Springdale Street	A	A
Westminster Boulevard & Springdale Street	D	F
Westminster Boulevard & I-405 SB On-Ramp	--	--
Westminster Boulevard & I-405 SB Off-Ramp (to EB Westminster Boulevard)	--	--
Option A		
Westminster Boulevard & I-405 NB Ramps (to WB & EB Westminster Boulevard)	C	B
Westminster Boulevard & Willow Lane	B	B
Option B		
Westminster Boulevard & I-405 NB Off-Ramp (to WB Westminster Boulevard)	--	--
Westminster Boulevard & I-405 NB On-Ramp	--	--
Westminster Boulevard & I-405 NB Off-Ramp/Willow Lane	--	--
Bolsa Chica Road – Valley View Street & Garden Grove Boulevard Interchange		
Garden Grove Boulevard & I-405 NB Off-Ramp/SR-22 EB Ramps	D	D
Garden Grove Boulevard & Bolsa Chica Road /Valley View Street	C	F
I-405 SB Ramps (to NB & SB Bolsa Chica Road) & Bolsa Chica Road	B	B
SR-22 WB/I-405 NB On-Ramp (for SB Valley View Street) & Valley View Street	--	--
SR-22 WB/I-405 NB On-Ramp (for NB Valley View Street) & Valley View Street	--	--
Seal Beach Boulevard Interchange		
I-405 NB Ramps & Seal Beach Boulevard	C	C
I-405 SB Ramps & Seal Beach Boulevard	D	F
Bear Street Interchange at SR-73		
SR-73 NB Ramps & Bear Street	--	--
SR-73 SB Ramps & Bear Street	--	--
Katella Avenue/Willow Street Interchange at I-605		
Katella Avenue & I-605 NB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 NB On-Ramp (for EB Katella Avenue)	A	A
Katella Avenue & I-605 NB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 NB Off-Ramp (to WB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for WB Katella Avenue)	--	--
Katella Avenue & I-605 SB Off-Ramp (to EB Katella Avenue)	--	--
Katella Avenue & I-605 SB On-Ramp (for EB Katella Avenue)	--	--
Willow Street & I-605 SB Off-Ramp (to WB Willow Street)	--	--
SOURCE: Albert Grover & Associates, 2011.		

TABLE 1-21: DAILY MAINLINE VHT	
Scenario	Daily VHT
Existing 2009	82,084
2020 No Build	190,282
2020 Alternative 1	114,733
2020 Alternative 2	99,122
2020 Alternative 3	97,256
2040 No Build	513,901
2040 Alternative 1	247,559
2040 Alternative 2	166,301
2040 Alternative 3	157,801
SOURCE: Parsons, 2011.	

2.0 ENVIRONMENTAL SETTING

2.1 METEOROLOGY

2.1.1 Climate

The South Coast Air Basin (Basin) is in an area of high air pollution potential due to its climate and topography. The general region lies in the semi-permanent high pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The Basin experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountains around the rest of its perimeter. The mountains and hills within the area contribute to the variation of rainfall, temperature, and winds throughout the region.

The Basin experiences frequent temperature inversions. Temperature typically decreases with height. However, under inversion conditions, temperature increases as altitude increases, thereby preventing air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created due to the interaction between the ocean surface and the lower layer of the atmosphere. This interaction creates a moist marine layer. An upper layer of warm air mass forms over the cool marine layer, preventing air pollutants from dispersing upward. Additionally, hydrocarbons and nitrogen dioxide (NO₂) react under strong sunlight, creating smog. Light, daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and NO₂ emissions. CO concentrations are generally worse in the morning and late evening (around 10:00 p.m.). In the morning, CO levels are relatively high due to cold temperatures and the large number of cars traveling. High CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO emissions are produced almost entirely from automobiles, the highest CO concentrations in the Basin are associated with heavy traffic. NO₂ concentrations are also generally higher during fall and winter days.

The mountains and hills within the Basin contribute to the variation of rainfall, temperature, and winds throughout the region. Within the project area, the average wind speed, as recorded at the Costa Mesa Wind Monitoring Station, is approximately three miles per hour, with calm winds occurring approximately 15 percent of the time. Wind in the project area predominately blows from the southwest.

The annual average temperature in the project area is 64 degrees Fahrenheit (°F).² The project area experiences an average winter temperature of approximately 56°F and an average summer temperature of approximately 71°F. Total precipitation in the project area averages approximately 14 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. Precipitation averages approximately eight inches during the

²Western Regional Climate Center, Historical Climate Information, available at <http://www.wrcc.dri.edu>, accessed November 21, 2010.

winter, approximately four inches during the spring, approximately two inches during the fall, and less than one inch during the summer.

2.1.2 Sunlight

The presence and intensity of sunlight are necessary prerequisites for the formation of photochemical smog. Under the influence of the ultraviolet radiation of sunlight, certain original or “primary” pollutants (mainly reactive hydrocarbons and oxides of nitrogen) react to form “secondary” pollutants (primarily oxidants). Since this process is time dependent, secondary pollutants can be formed many miles downwind from the emission sources. Due to the prevailing daytime winds and time-delayed nature of photochemical smog, oxidant concentrations are highest in the inland areas of Southern California.

2.1.3 Temperature Inversion

Temperature normally declines with altitude. A reversal of this atmospheric state, where temperature increases with altitude, is called an inversion. The height from the earth’s surface to the inversion base is known as the mixing height. With persistent low inversions and cool coastal air, morning fog and low stratus clouds are common. Cloudy days are less likely in the eastern portions of the Basin and about 25 percent more likely along the coast. The vertical dispersion of air pollutants in the district is limited by temperature inversions in the atmosphere close to the earth’s surface.

Inversions are generally lower in the nighttime when the ground is cool, than during daylight hours when the sun warms the ground and, in turn, the surface air layer. As this heating process continues, the temperature of the surface air layer approaches the temperature of the inversion base, causing heating along its lower edge. If enough warming takes place, the inversion layer becomes weak and opens up to allow the surface air layers to mix upward. This can be seen in the middle to late afternoon on a hot summer day when smog appears to clear suddenly. Winter inversions typically break earlier in the day, preventing excessive contaminant build-up.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino Counties. In the winter, the greatest pollution problems are carbon monoxide and oxides of nitrogen because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form photochemical smog.

2.1.4 Greenhouse Gases

Greenhouse gas (GHG) emissions refer to a group of emissions that are generally believed to affect global climate conditions. The greenhouse effect compares the Earth and the atmosphere surrounding it to a greenhouse with glass panes. The glass panes in a greenhouse let heat from sunlight in and reduce the amount of heat that escapes. GHGs, such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), keep the average surface temperature

of the Earth close to 60 °F. Without the greenhouse effect, the Earth would be a frozen globe with an average surface temperature of about 5°F.

In addition to CO₂, CH₄, and N₂O, GHGs include hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and water vapor. Of all the GHGs, CO₂ is the most abundant pollutant that contributes to climate change through fossil fuel combustion. CO₂ comprised 83.3 percent of the total GHG emissions in California in 2002. The other GHGs are less abundant but have higher global warming potential than CO₂. To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent mass of CO₂, denoted as CO₂e. The CO₂e of CH₄ and N₂O represented 6.4 and 6.8 percent, respectively, of the 2002 California GHG emissions. Other high global warming potential gases represented 3.5 percent of these emissions. In addition, there are a number of human-made pollutants, such as CO, NO_x, non-methane VOC, and SO₂, that have indirect effects on terrestrial or solar radiation absorption by influencing the formation or destruction of other climate change emissions.

2.1.5 Air Quality Management

All areas designated as nonattainment under the California Clean Air Act (CCAA) are required to prepare plans showing how the area would meet the State air quality standards by its attainment dates. The Air Quality Management Plan (AQMP) is the South Coast Air Quality Management District (SCAQMD) plan for improving regional air quality. It addresses CCAA requirements and demonstrates attainment with State and federal ambient air quality standards. The AQMP is prepared by SCAQMD and the Southern California Association of Governments (SCAG). The AQMP provides policies and control measures that reduce emissions to attain both State and federal ambient air quality standards by their applicable deadlines. Environmental review of individual projects within the Basin must demonstrate that daily construction and operational emissions thresholds, as established by the SCAQMD, would not be exceeded. The environmental review must also demonstrate that individual projects would not increase the number or severity of existing air quality violations.

The 2007 AQMP was adopted by the SCAQMD on June 1, 2007. The 2007 AQMP proposes to demonstrate attainment of the federal PM_{2.5} standards through a more focused control of sulfur oxides (SO_x), directly-emitted particulate matter 2.5 microns or less in diameter (PM_{2.5}), and NO_x, supplemented with VOC, by 2015. The eight-hour ozone control strategy builds upon the PM_{2.5} strategy, augmented with additional NO_x and VOC reductions to meet the standard by 2024. The 2007 AQMP also addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP is consistent with and builds upon the approaches taken in the 2003 AQMP. However, the 2007 AQMP highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant.

The United States Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for the following air pollutants: CO, ozone (O₃), NO₂, sulfur dioxide (SO₂), particulate matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}, respectively), and lead (Pb). These pollutants are referred to as criteria pollutants because numerical criteria have been established for each pollutant, which define acceptable levels of exposure. The USEPA has revised the NAAQS several times since their original

implementation and would continue to do so as the health effects of exposure to air pollution are better understood.

States with air quality that did not achieve the NAAQS were required to develop and maintain State Implementation Plans (SIPs). These plans constitute a federally enforceable definition of the State's approach (or "plan") and schedule for the attainment of the NAAQS. Air quality management areas were designated as "attainment," "nonattainment," or "unclassified" for individual pollutants depending on whether or not they achieve the applicable NAAQS and California Ambient Air Quality Standards (CAAQS) for each pollutant. It is important to note that because the NAAQS and CAAQS differ in many cases, it is possible for an area to be designated attainment by the USEPA (meets NAAQS) and nonattainment by the California Air Resources Board (CARB) (does not meet CAAQS) for the same pollutant.

2.1.6 Transportation Conformity Rule

Transportation conformity is an analysis required under CAA section 176(c) (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with the purpose of the SIP. Regional conformity for a given project is analyzed by discussing if the proposed project is included in a conforming Regional Transportation Plan (RTP) or Transportation Improvement Plan (TIP) with substantially the same design concept and scope that was used for the regional conformity analysis. Project level conformity is analyzed by discussing if the proposed project would cause localized exceedances of CO, PM_{2.5}, and/or PM₁₀ standards, or if it would interfere with "timely implementation" of Transportation Control Measures called out in the State Implementation Plan.

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved. Regional level conformity in California is concerned with how well the region is meeting the standards set for CO, NO₂, O₃, and PM. California is in attainment for the other criteria pollutants. At the regional level, RTP are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Southern California Association of Governments and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

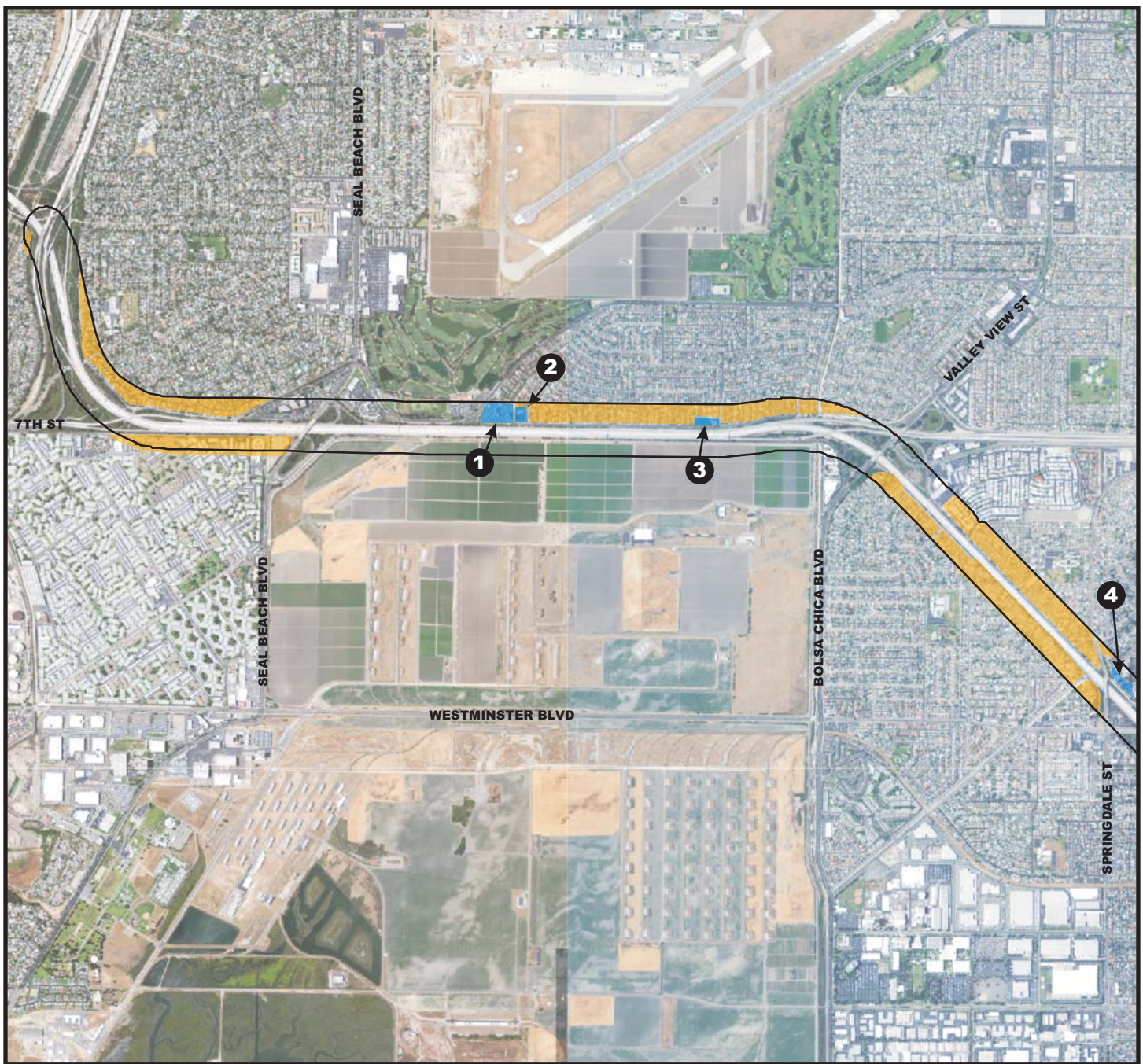
Conformity at the project-level also requires "hot spot" analysis if an area is "nonattainment" or "maintenance" for CO and/or particulate matter. A region is a "nonattainment" area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called "maintenance" areas. "Hot spot" analysis is essentially the same, for technical purposes, as CO

or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

2.1.7 Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. CARB has identified the following typical groups who are most likely to be affected by air pollution: children under 14, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, child care centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. **Figures 2-1** through **2-3** show sensitive receptors within 500 feet of the ROW. The map identifications correspond to the following receptors:

1. Seal Beach Tennis Center
2. Blue Bell Park
3. Almond Park
4. Indian Village Park
5. Cascade Park
6. Westminster Good Samaritan Church
7. Buckingham Park
8. Westminster High School
9. College Park
10. Pleasant View Park
11. El Dorado Preschool
12. Huntington Valley Preschool
13. Fountain Valley High School
14. Los Alamos Park
15. Moon Park
16. California Elementary School
17. Charles W. TeWinkle Middle School
18. Ginsler Park

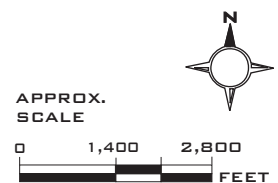


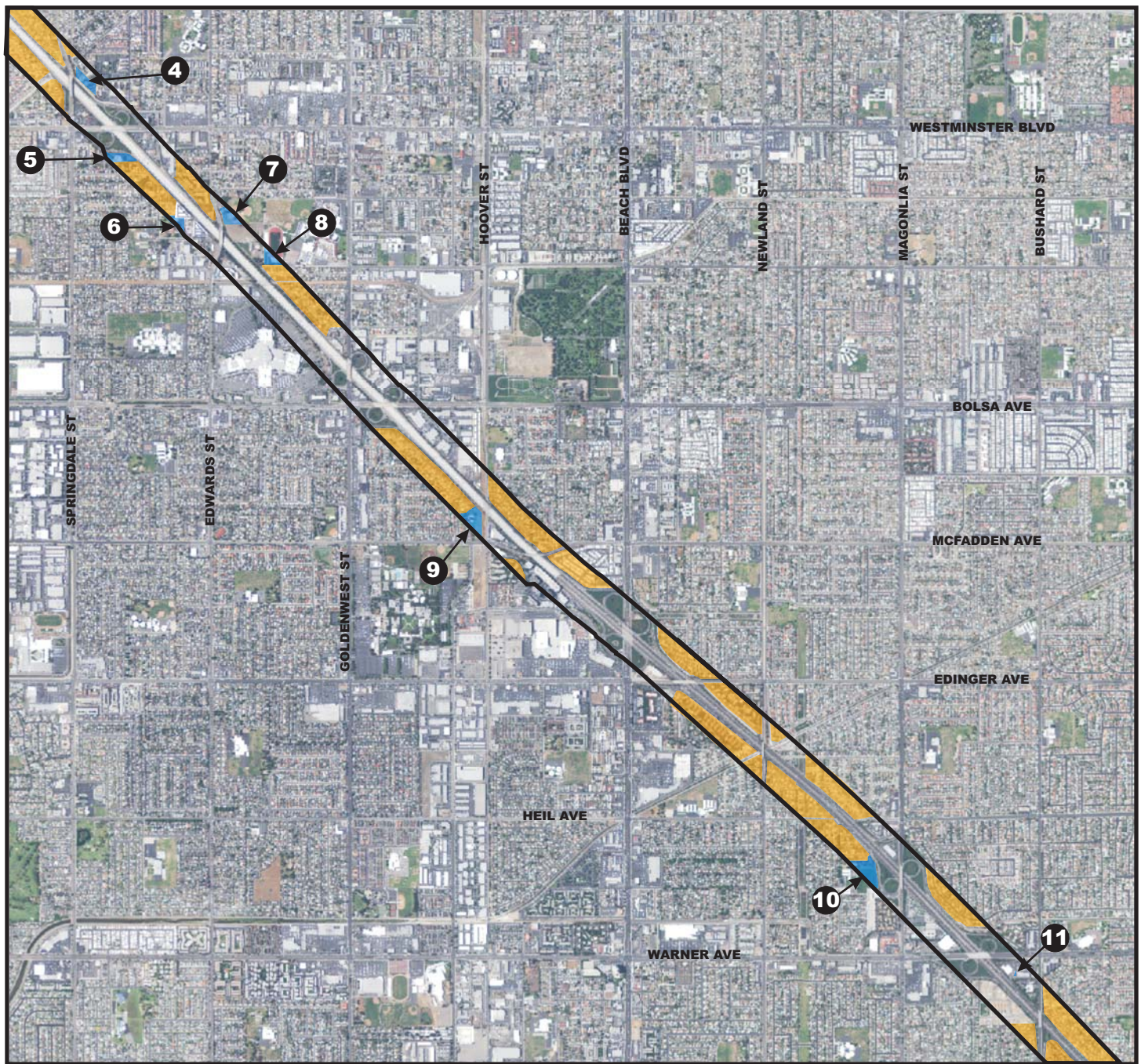
LEGEND:

500-foot Buffer
 Residential
 Schools, Parks, Churches

- #** Sensitive Receptor
- | | |
|------------------------------------|-------------------------------|
| 1. Seal Beach Tennis Center | 3. Almond Park |
| 2. Blue Bell Park | 4. Indian Village Park |

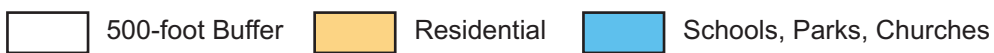
SOURCE: TAHA, 2011.





Add McDowell Park

LEGEND:



- | | | |
|---|-----------------------------------|--------------------------------|
| # Sensitive Receptor | | |
| 4. Indian Village Park | 7. Buckingham Park | 10. Pleasant View Park |
| 5. Cascade Park | 8. Westminster High School | 11. El Dorado Preschool |
| 6. Westminster Good Samaritan Church | 9. College Park | |

SOURCE: TAHA, 2011.

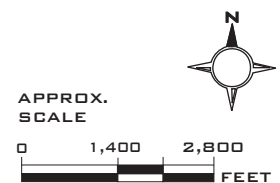
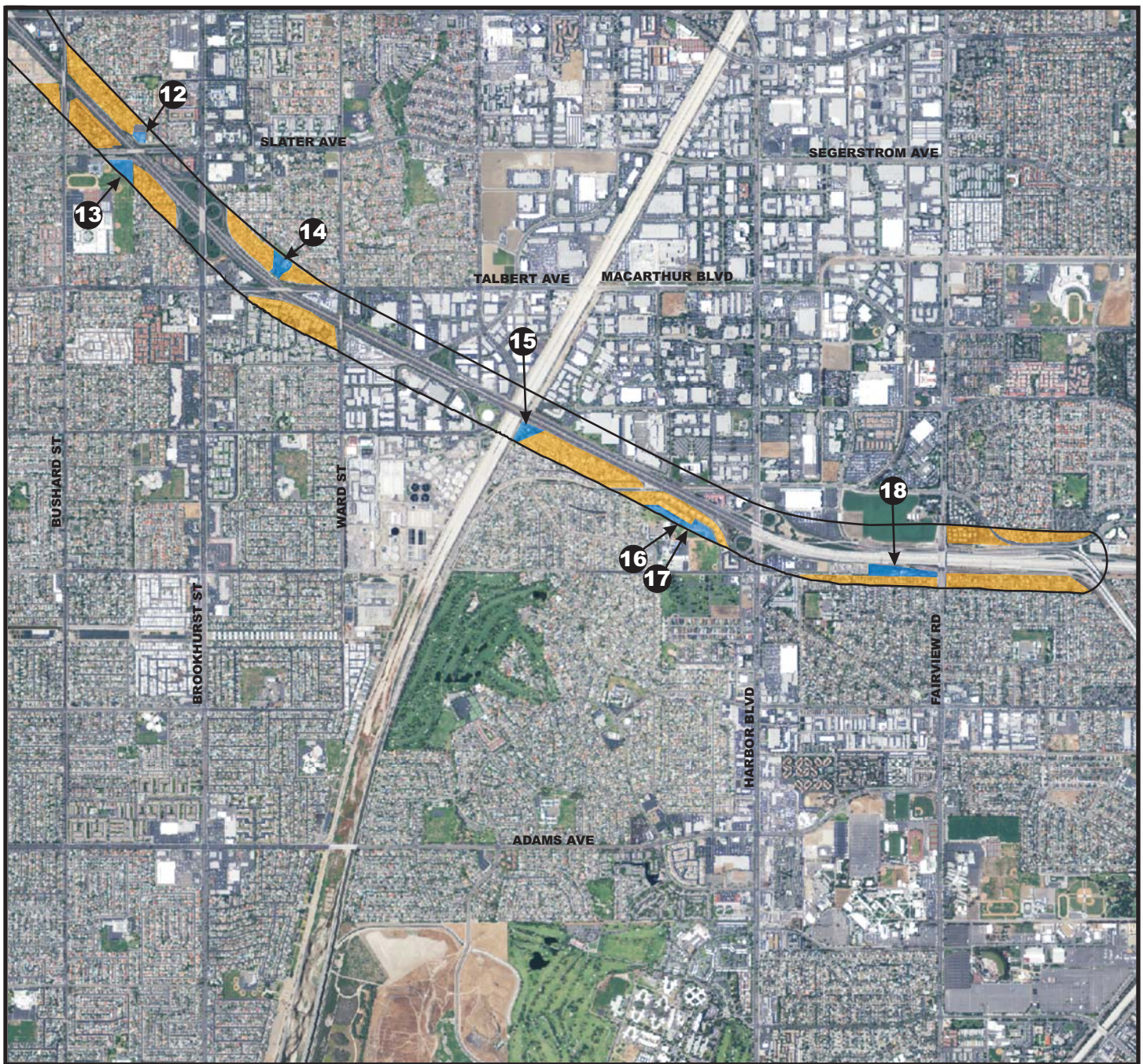
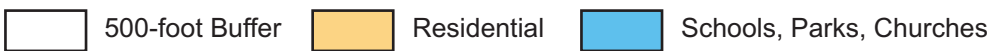


FIGURE 2-2

SENSITIVE RECEPTOR LOCATIONS



LEGEND:



Sensitive Receptor

- | | |
|--|--|
| 12. Huntington Valley Preschool | 16. California Elementary School |
| 13. Fountain Valley High School | 17. Charles W. TeWinkle Middle School |
| 14. Los Alamos Park | 18. Gisler Park |
| 15. Moon Park | |

SOURCE: TAHA, 2011.

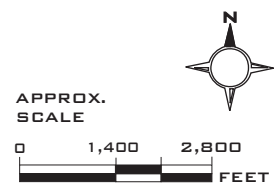


FIGURE 2-3

SENSITIVE RECEPTOR LOCATIONS

3.0 REGULATORY FRAMEWORK

3.1 FEDERAL CLEAN AIR ACT

The Clean Air Act (CAA) as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act (CCAA) of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called NAAQS. Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: CO, NO₂, O₃, particulate matter, Pb, and SO₂. The CAA requires USEPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The federal standards are summarized in **Table 3-1**. The USEPA has classified the Basin as maintenance for CO and nonattainment for O₃, PM_{2.5}, and PM₁₀.

3.2 CALIFORNIA CLEAN AIR ACT

In California, the CCAA is administered by the CARB at the State level and by the air quality management districts and air pollution control districts at the regional and local levels. The CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting the State requirements of the CAA, administering the CCAA, and establishing the CAAQS. The CCAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. CARB regulates mobile air pollution sources, such as motor vehicles. CARB is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB established passenger vehicle fuel specifications, which became effective in March 1996. CARB oversees the functions of local air pollution control districts and air quality management districts, which, in turn, administer air quality activities at the regional and county levels. The State standards are summarized in **Table 3-1**.

The CCAA requires CARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard and are not used as a basis for designating areas as nonattainment. Under the CCAA, the Orange County portion of the Basin is designated as a nonattainment area for O₃, PM_{2.5}, and PM₁₀.³

³CARB, Area Designation Maps, available at <http://www.arb.ca.gov/design/adm/adm.htm>, accessed November 21, 2010.

TABLE 3-1: STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS FOR THE SOUTH COAST AIR BASIN

Pollutant	Averaging Period	California		Federal	
		Standards	Attainment Status	Standards	Attainment Status
Ozone (O ₃)	1-hour	0.09 ppm (180 µg/m ³)	Nonattainment	--	--
	8-hour	0.070 ppm (137 µg/m ³)	n/a	0.075 ppm (147 µg/m ³)	Nonattainment
Respirable Particulate Matter (PM ₁₀)	24-hour	50 µg/m ³	Nonattainment	150 µg/m ³	Nonattainment
	Annual Arithmetic Mean	20 µg/m ³	Nonattainment	--	--
Fine Particulate Matter (PM _{2.5})	24-hour	--	--	35 µg/m ³	Nonattainment
	Annual Arithmetic Mean	12 µg/m ³	Nonattainment	15.0 µg/m ³	Nonattainment
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m ³)	Attainment	9 ppm (10 mg/m ³)	Attainment/ Maintenance
	1-hour	20 ppm (23 mg/m ³)	Attainment	35 ppm (40 mg/m ³)	Attainment/ Maintenance
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	Attainment	53 ppb (100 µg/m ³)	Unclassified
	1-hour	0.18 ppm (338 µg/m ³)	Attainment	100 ppb (190 µg/m ³)	n/a
Sulfur Dioxide (SO ₂)	24-hour	0.04 ppm (105 µg/m ³)	Attainment	--	--
	3-hour	--	--	--	--
	1-hour	0.25 ppm (655 µg/m ³)	Attainment	75 ppb (196 µg/m ³)	Attainment
Lead (Pb)	30-day average	1.5 µg/m ³	Attainment	--	--
	Calendar Quarter	--	--	0.15 µg/m ³	Attainment

n/a = not available

SOURCE: CARB, *Ambient Air Quality Standards, and Attainment Status*, September 8, 2010.

3.3 CALIFORNIA STATE IMPLEMENTATION PLAN

The 1990 amendments to the federal CAA set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the NAAQS. The promulgation of the national eight-hour ozone standard and the fine particulate matter (PM_{2.5}) standards in 1997 resulted in additional statewide air quality planning efforts. In response to new federal regulations, SIPs also began to address ways to improve visibility in national parks and wilderness areas. SIPs are not single documents, but rather a compilation of new and previously submitted plans, programs, district rules, State regulations, and federal controls. Many of California's SIPs rely on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations, and limits on emissions

from consumer products. State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the USEPA for approval and publication in the Federal Register. The Code of Federal Regulations Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items which are included in the California SIP.

3.4 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The 1977 Lewis Air Quality Management Act created the SCAQMD to coordinate air quality planning efforts throughout Southern California. This Act merged four county air pollution control agencies into one regional district to better address the issue of improving air quality in Southern California. Under the Act, renamed the Lewis-Presley Air Quality Management Act in 1988, the SCAQMD is the agency principally responsible for comprehensive air pollution control in the region. Specifically, the SCAQMD is responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain State and federal ambient air quality standards in the district. Programs that were developed include air quality rules and regulations that regulate stationary sources, area sources, point sources, and certain mobile source emissions. The SCAQMD is also responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

The SCAQMD monitors air quality within the project area. The SCAQMD has jurisdiction over an area of 10,743 square miles, consisting of Orange County; the non-desert portions of Los Angeles, Riverside, and San Bernardino counties; and the Riverside County portion of the Salton Sea Air Basin and Mojave Desert Air Basin. The Basin is a subregion of the SCAQMD and covers an area of 6,745 square miles. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The Basin is bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino and San Jacinto mountains to the north and east; and the San Diego County line to the south (**Figure 3-1**).